

REMARKS

Claims 1-20 are all the claims pending in the application. Claim 1 is the only independent claim.

Applicants thank the Examiner for acknowledging the claim for priority and receipt of the priority documents. Applicants also thank the Examiner for forwarding an initialed copy of the PTO-1449 form submitted with the Information Disclosure Statement on June 19, 2001.

Drawings

The Examiner objects to Fig. 7, alleging that the configuration is unclear to the Examiner. Applicants submit with this Amendment a request for approval of proposed drawing corrections in which Fig. 7 is modified. This modification is not new matter since one of ordinary skill in the art at the time of the filing of this application would understand from the specification and drawings that one of the three phase voltages of the three-phase AC that is given to the PWM inverter 4 is obtained from the other two phase voltages.

Claim Rejections 35 U.S.C. §§102/103

Claims 1-17 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by JP 06-225573. Claims 18-20 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over JP '573 in view of Okano (US 5,777,447). Applicants respectfully traverse this rejection at least because JP '573 does not teach or suggest the claimed motor control device. For example, JP '573 does not teach or suggest a micro-controller that limits "a motor current in accordance with an integrated value of a predetermined function of a phase current of the motor".

Applicants first note that JP '573 does not include Figs. 6 and 9, which were referred to by the Examiner, but merely includes Figs. 1-5.

Claim 1

With respect to claim 1, JP '573 describes a limiter that limits the two-phase voltage commands VO and VT of a synchronous rotary coordinate system. The limiter shown in Fig. 1 limits the voltages commands VO, VT based on a ratio of a normal voltage rating. In order to perform overheat protection of the motor without interrupting the electrification of the motor, when the values for VO or VT exceed the limit values, previous values for VO, VT are instead used as the voltage commands. In short, the micro-controller does not limit the motor current, but instead limits the voltage commands VO, VT.

In addition, the two-phase voltage commands of the synchronous rotary coordinate system are calculated according to the proportional-plus-integral value of the torque current command I_{TS} , the exciting-current command I_{OS} , and detection values I_{OFB} and I_{TFB} . This is in contrast to the claimed micro-controller which limits motor current "in accordance with an integrated value of a phase current of the motor".

As such, Applicants request that the Examiner withdraw the rejection of claim 1 at least because JP '573 does not teach or suggest a micro-controller that limits "a motor current in accordance with an integrated value of a predetermined function of a phase current of the motor".

Claim 2

With respect to dependent claim 2, JP '573 merely appears to show a limiter that limits the values of voltage commands VO, VT based on the proportional-plus-integral value calculation. There is no teaching, however, that the limiter limits a peak value of the voltage

commands in accordance with the calculation. Instead, the peak value of the voltage commands is limited according to previous values, not this calculation.

As such, Applicants request that the Examiner withdraw the rejection of claim at least for the reason discussed above and because of its dependency from claim 1.

Claims 3-17

Applicants request that the Examiner withdraw the rejection of claims 3-17 at least because of their dependency from claim 1.

Claims 18-20

Applicants request that the Examiner withdraw the rejection of claims 18-20 at least because of their dependency from claim 1, and because Okano, which the Examiner asserts shows a control apparatus for a motor, does not cure the deficiencies in claim 1 discussed above.

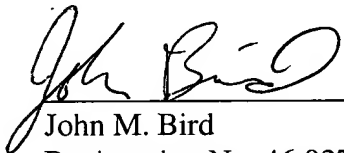
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
Appln. No. 09/883,391

Our Ref: Q64978
Art Unit 2837

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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Date: October 25, 2002

APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Please amend the third full paragraph of page 14 as follows:

The respective desired currents on the three-phase a.c. coordinates whose peak values are limited are compared with the detected currents of the respective phases, and then feedback-controlled in accordance with the algorithm such as P control by the current control section 7.

The operating amounts of the respective current control sections are given to the PWM inverter 4, and the PWM inverter 4 PWM-drives the motor 1. One of the three phase voltages v_w^* of the three-phase AC that is given to the PWM inverter 4 is obtained from the other two phase voltages v_u^* , v_v^* .

IN THE CLAIMS:

The claims are changed as follows:

1. (Amended) A motor control device for a multi-phase motor, comprising:
a drive circuit for driving said multi-phase motor; and
a micro-controller for controlling said drive circuit;
wherein said micro-controller limits a motor current in accordance with an integrated value of a predetermined function of a phase current of the motor.